

In the Claims

The following listing of claims replaces all prior listings and versions of claims in this application.

1. (Currently amended) A processor comprising:

a plurality of registers;

circuitry configured to process a plurality of instructions associated with an instruction set including a plurality of branch and non-branch instructions, the plurality of instructions each having a multi-byte length, the plurality of instructions accessible at multi-byte aligned addresses;

a single piece of common subcircuitry operable coupled to one of the registers, the single piece of common subcircuitry configured to perform sign extensions of an immediate field in the non-branch instructions and to be reused to perform sign extensions of an immediate field having units of bytes in the branch instructions to calculate a target address for the branch instructions, wherein said common subcircuitry operating on [[said]] the non-branch instructions is the same subcircuitry operating upon [[said]] the branch instructions; and

wherein the multi-byte aligned branch instructions are operable configured to access the remaining of the plurality of instructions at byte aligned addresses, wherein each of the multi-byte aligned branch instructions has a start address that is an integer multiple of a byte aligned address and the integer multiple is greater than one.

2. (Original) The processor of claim 1, wherein the plurality of instructions are accessed at word aligned addresses.

3. (Original) The processor of claim 1, wherein the plurality of instructions are accessed at half-word aligned addresses.

4. (Previously Presented) The processor of claim 1, wherein accessing the instructions comprises reading to and writing from the addresses.

5. (Previously Presented) The processor of claim 1, wherein the branch instructions comprise branch and conditional branch instructions.

6. (Previously Presented) The processor of claim 1, wherein the branch instructions comprise a branch offset and a current program counter value.

7. (Previously Presented) The processor of claim 6, wherein the units of branch offset and current program counter are in bytes.

8. (Original) The processor of claim 1, wherein the plurality of instructions are one word in length.

9-13. (Canceled)

14. (Currently amended) A field programmable gate array, comprising:

a plurality of registers;

circuitry configured to process a plurality of instructions including a plurality of branch instructions and a plurality of non-branch instructions associated with an instruction set, one of the plurality of branch instructions including an immediate field having units of bytes and one of the plurality of non-branch instructions including an immediate field; and

a single piece of common subcircuitry that performs is coupled to one of the registers,
the single piece of common subcircuitry performs a sign extension of the immediate field associated with the one of the branch instructions and that performs is reused to perform a sign extension of the immediate field associated with the one of the non-branch instructions, wherein said common subcircuitry operating on [[said]] the non-branch instructions is the same subcircuitry operating upon [[said]] the branch instructions, wherein the sign extension of the immediate field associated with the one of the branch instructions is performed to determine a branch target address~~[[;]]~~, wherein each of the plurality of branch instructions and non-branch instructions has a multi-byte length, has a start address that is an integer multiple of a byte

aligned address, and is ~~operable~~ configured to access the remaining of the plurality of instructions at byte aligned addresses, wherein the integer multiple is greater than one.

15. (Canceled)

16. (Previously Presented) The field programmable gate array of claim 14, wherein the plurality of instructions are accessed at half-word aligned addresses.

17. (Currently amended) The field programmable gate array of claim 14, wherein the branch instructions comprise branch and conditional branch instructions.

18. (Previously Presented) The field programmable gate array of claim 14, wherein the common subcircuitry is used to handle the immediate field associated with the one of the branch instructions and the immediate field associated with the one of the non-branch instructions and wherein an immediate field value of each of the immediate fields is maintained in units of bytes.

19. (Previously Presented) The field programmable gate array of claim 18, wherein common subcircuitry is used to perform sign-extensions of the immediate field associated with the one of the branch instructions and the immediate field associated with the one of the non-branch instructions.

20-30. (Canceled)

31. (Currently amended) The processor of claim 1, wherein one of a primary or secondary component accesses a memory of the processor directly through ports without access through a system bus, and wherein the processor is implemented on a field programmable gate array that does not comprises a system bus.

32. (Currently amended) The field programmable gate array of claim 14, wherein one of a primary or secondary component accesses a memory of the field programmable gate array directly through ports without access through a system bus, and wherein the array does not comprises a system bus.